MOBILE DATA MANAGEMENT SYSTEM

CROSS REFERENCE TO RELATED APPLICATIONS

This patent application claims priority to commonly-owned United States Patent Application Serial No. 09/799,479, entitled "Computerized Information Process and Retrieval System" filed on February 22, 2001, which is herein incorporated by reference. This patent application relates to commonly owned United States Patent Application Serial No. 09/436,323 filed on November 8, 1999 entitled Health Monitoring and Diagnostic Device and Network-Based Health Assessment and Medical Records Maintenance System, which is herein incorporated by reference.

TECHNICAL FIELD

The present invention relates generally to the field of medical treatment systems, and more particularly to mobile data management systems that transmit data to remote locations for more effective medical treatment of a patient.

BACKGROUND OF THE INVENTION

Evolutions in modern health care have produced scores of highly trained medical professionals that efficiently respond to emergency situations. Generally, a dispatcher responds to an emergency call by contacting the closest available medical emergency

unit. Each medical emergency unit could include an emergency medical technician (EMT) and a paramedic. After being assigned a call, the medical emergency unit assumes primary responsibility for making sure that the patient receives the proper medical treatment.

In accomplishing this objective, medical emergency units assess the status of the situation and the medical condition of the potential patient in particular. In assessing the potential patient's status, EMTs and paramedics can perform a cursory examination and begin collecting background information from either the victim or witnesses. The background information can include the victim's name, type of insurance, medical history, and circumstances surrounding the call.

After assessing the status of the patient, medical personnel may decide if the patient should be transported to a medical facility. When the medical condition of the patient warrants hospital treatment, these individuals transport the patient to the medical facility. While in route, an EMT can complete several procedures designed at stabilizing the patient. These procedures could include measuring the patient's vitals such as pulse, respiration, blood pressure, and heart rate. In addition, medical personnel can perform other medical procedures such as administering cardiopulmonary resuscitation or stabilizing the patient's neck. Consequently, medical personnel manually complete multiple tasks including transporting the patient, recording treatment administered to the patient, and notifying the medical facility of the patient's expected arrival. In notifying the medical facility, emergency medical personnel may give a general synopsis of the patient's condition to the medical facility as well as surrounding circumstances. For example, a paramedic may inform the hospital that the victim has a gunshot to the head and is unconscious.

When the patient arrives at the medical facility, an EMT may begin briefing the hospital staff on the patient's medical condition. For example, the EMT could begin reciting the patient's name, vital signs, circumstances surrounding the trauma, treatment, as well as some of the patient's background information. Because the patient's medical condition could be life threatening at this stage, effective conveyance of this information from emergency medical personnel to the hospital staff can be particularly important.

Once briefed, the hospital staff can appropriately treat the patient. Because the medical facility may have only received a general synopsis of the patient's condition, this step may involve an exploration of the possible causes for the patient's physical condition as well as acquiring additional information from either the victim or the victim's family. For example, the hospital could spend valuable time identifying present medical conditions aggravated by the present trauma.

Despite the development in the area of medical treatment system, most conventional solutions remain primarily manual and include a great potential for error. For example, relevant medical data could be omitted during the conveyance of information from the emergency medical personnel to the hospital personnel. In addition, implementation of conventional treatment solutions often results in considerable time losses. For example, giving the medical facility only a general synopsis of the patient's most critical issues could result in an extended exploration time. Hospital personnel could spend critical time determining the patient's medical history, as well as current medical problems. For a victim that lost a considerable amount of blood between the occurrence of the trauma and arrival at the hospital, expending additional time could be fatal. Thus, a need still exists for a more effective medical treatment system that reduces the potential for error while minimizing time losses by better preparing the hospital.

SUMMARY OF THE INVENTION

The present invention meets the needs described above in a medical treatment system that more effectively treats patients by using a data management system. The unique design of the data management system provides a compact portable terminal and transceiver that can both transmit and receive data from remote locations. Using the data management system creates several advantages over conventional treatment methods including allowing emergency medical personnel more time for treating the patient, enabling user customization of time saving features, and creating more time for hospitals to prepare for arriving traumas.

To save time during treatment, emergency medical personnel can use a multipurpose card, medical devices, and input devices with the data management

system. Because multipurpose cards, or smartcards, often include secure data storage areas, the card can store background information for a patient such as name, photograph, primary care physician, blood type, living will, address, and insurance information. Once the smartcard is inserted, the data management system can efficiently extract this information from the card without beginning a lengthy information acquisition period. For example, an EMT can learn that a patient has diabetes and alter treatment accordingly. In addition, a medical device interface within the data management system can connect this system to various commercially available medical devices. Thus, the data management system electronically records the patient's vitals with limited involvement by emergency medical personnel. Similarly, the data management system includes an input device interface that can connect input devices, which aid medical personnel in recording administered treatment. Using a voice recognition device, medical personnel can simply verbalize administered treatment and the data management system electronically records this information. By entrusting some of the administrative tasks, such as data collection and recordation associated with treating a patient to the data management system, medical personnel can focus more time on actually treating the patient.

Another advantage resulting from use of the data management system allows user customization of the desired amount of automation. Users can indicate if reports or designated forms should be automatically constructed. For example, the data management system can automatically generate a hospital admission form when it receives background information. Similarly, this system could also automatically generate a triage report after receiving medical readings and administered treatment. Alternatively, a user could specify that a location report, which uses a global positioning system, should not be generated until medical personnel specify both an originating destination and a final destination. Users can also specify if reports should be automatically transmitted to the receiving hospital or periodically updated. For example, a user could specify that a location report, which includes an estimated time of arrival, should be sent when the emergency vehicle is at least fifteen miles from the medical facility and be updated every three minutes.

Finally, using the data management system results in producing more prepared hospitals that can more effectively treat patients. Because the data management system transmits data to the medical facility before the patient arrives, hospital personnel can better assess the victim's condition before arriving at the hospital. For example, the hospital can download physician notes regarding the patient from a computer after receiving the patient's name, primary care physician, and medically relevant conditions from a transmitted report. By knowing medically relevant patient information, the hospital can better prepare for the patient, by gathering resources, requesting additional medical staff, and reassigning hospitals beds in the trauma center. Consequently, the hospital staff can more effectively service arriving victims. Moreover, the hospital can restrict ambulances from arriving when the hospital reaches its capacity. For example, a hospital that received twenty children with serious injuries resulting from collision of school buses can notify paramedics that it is fully occupied.

Generally described, the invention is a mobile data management system for use in administering medical treatment to a patient. An interface transfers data associated with the patient from an input device. A control system analyzes the data and generates a report that identifies medically relevant data. This medically relevant data aides in the treatment of the patient. The invention also includes a display for viewing either the data or the report. A communication system transfers the report between data management system and a remote location before the patient arrives.

Alternatively, the invention is an emergency medical treatment system for use by medical personnel in treating a patient en route to a medical facility. An interface transfers medically relevant data associated with the patient from at least one device. A control system analyzes the data and generates a report in response to processing at least a portion of the data received by the interface. The emergency medical treatment system includes a display for viewing the report, the data, or some combination thereof. A communication system transfers the report across a network to the medical facility before the patient arrives.

The invention also includes a method for treating a patient en route to a medical facility using a mobile data management system. In one step, the method receives

medically relevant data associated with the patient. At least a portion of the data is processed. At least one report is generated in response to processing the data. The report is transferred between the treatment system and the medical facility.

In view of the foregoing, it will be appreciated that the data management system avoids the drawbacks of prior treatment systems. The specific techniques and structures employed by the invention to improve over the drawbacks of the prior systems and accomplish the advantages described above will become apparent from the following detailed description of the embodiments of the invention and the appended drawings and claims.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a functional block diagram of an environment in which the data management system of the present invention can be used.

FIG. 2A is a function block diagram of the data management system of FIG. 1 illustrating some of the components of the data management system of FIG. 1.

FIG. 2B is perspective view on one embodiment of the data management system of FIG. 2A illustrating a cradle.

FIG. 3 is a logic flow diagram for a method of more effectively treating a patient using the data management system of FIG. 2.

DETAILED DESCRIPTION OF THE EMBODIMENTS

The present invention may be embodied in a data management system that more effectively treats patients by using a data management system. Generally, the data management system receives and processes medical information from a host of sources. In processing the medical information, this system could produce several reports based on the received medical information. By transmitting these reports to a remote location, the data management system can send reports before the patient arrives. Consequently, the remote location could use these reports in more effectively treating the patient. To enable more effective treatment, the data management system uses an interface, control system, display, memory storage element, GPS device, and a communication system.

Alternatively, the data management system can use a combination of any of these components.

The data management system includes an interface that receives data associated with the patient. Generally, the interface includes different types of interfaces that receive information from various devices. One such interface could be a medical device interface that uses a combination of hardware and software for receiving data. This type of interface could receive information from a host of commercially available medical devices such as a thermometer, blood pressure cuff, heart monitor, fetal monitor, pulse-ox machine, glucometer, ventilator, and other suitable devices. For example, a glucometer can transfer a compiled list of readings to the data management system. In response, the data management system can produce and transmit a report that identifies trends, for example, associated with the recorded glucose readings. Thus, the physician can more effectively treat the patient using this report.

Instead of the medical device interface, the data management system can include a data drive or an input device interface. Using a data drive enables transfer of data between the data management system and a smart card, floppy disk, optical disk, or some other suitable device. For example, a smartcard could store a parental consent, do not resuscitate order, and transfusion instructions. For security purposes, the smart card could include features that restrict access of the stored data to medical personnel only. Alternatively, the input device interface of the data management system can transfer data from input devices such as a keyboard, touch sensitive screen, voice recognition device, touch pad, or some other suitable input device. Using input devices enable recording of information not necessarily associated with a device. For example, a voice recognition device can record that the paramedic inserted an IV into the patient. Because the input device interface can work in concert with the medical device interface, the data management system can evaluate the variation of the heartbeat of the patient since insertion of the IV.

In addition to the interface, the data management system can also include a control system, display, and memory storage element. The control system can synthesize the received data and produce the report. Through a combination of

hardware and software, users can specify both the type of report and how often it should be generated. For example, a user can specify that the control system prepare one admission form for each patient that includes the patient's name, address, insurance information, and nearest relative. After producing the report, the control system can present the report for viewing using a display. The display could be a monitor, television, active matrix liquid crystal display, or a dual scan liquid crystal display. For example, the data management system could include a monitor jack that enables connection with commercially available computer monitors. The data management system also includes a memory storage element that could be random access memory (RAM), removable RAM, programmable read only memory (PROM), electrically erasable PROM, or some other suitable memory storage element. Using the memory storage element, the control system can store previously processed data for subsequent retrieval. For example, the control system could store a triage report for the patient that indicated the patient's blood pressure was 146/102. Five minutes later, the control system can receive a blood pressure of 150/110 from the interface. By retrieving the blood pressure from the memory storage element, the control system can prepare a second triage report for this patient that includes the present blood pressure rate as well as percent difference. Thus, the new triage report would also indicate that systolic pressure increased by 3% while the diastolic pressure increased by 7%.

Using a communication system, the data management system transfers generated reports to remote locations. The communication system could be an Ethernet or a wireless data network. The wireless data network could include a cellular system or a closed circuit satellite system, such as one used by Skytel. In addition, the data management system could include a global positioning device that easily identifies the location of the data management system by sending and receiving signals from a host of satellites. The global positioning device could be a commercially available device such as the Street Pilot III manufactured by Garmin. By transferring location information to the medical facility, medical personnel can appropriately prepare for treatment. For example, transferring a triage report can inform hospitals of the status of a patient before the

patient arrives. Consequently, medical personnel at these remote locations can monitor a patient's progress.

The design of the data management system enables use of this system in a variety of applications for both immediate and remote monitoring of a patient's condition. Using the data management system within an emergency medical treatment system, medical personnel can treat a patient while en route to a medical facility. As medical personnel such as paramedics and emergency medical technicians enter the trauma cite, they begin ascertaining the events surrounding the victim's injury. Due to the compact design, medical professionals can record the results of these inquiries using one or more of the input devices associated with the data management system. While continuing to treat the patient inside the ambulance, the data management system can record associated readings from connected medical devices. Using readings from a global positioning device, medical devices, and input devices, the data management system transmits to a hospital a triage report, location report that includes an estimated time of arrival, and an admission form. Consequently, the hospital can appropriately prepare for and anticipate the arrival of the patient.

Alternatively, the data management system can be used in diabetes monitoring. Typically, physicians request that patients record their glucose level before each meal. Periodically, a physician may review these readings and adjust the prescribed medication dosage accordingly. Using the invented data management system, the physician can receive a report that analyzes these logged readings and identifies any related trends. In response, the physician can electronically request that the patient modify their dosage by transmitting the new dosages to the data management system. In an alternative embodiment, the data management system may periodically transmit a report to the patient's physician. Subsequently, the physician may transmit a message to the data management system that indicates the patient should come in immediately for the first glucose reading above 300. Moreover, programming in the data management system can set an alert for this glucose level. Hence, this system allows effective treatment of a diabetic patient without the considerable time loss associated with extended or recurring

doctor visits. Because this system records readings and monitors remotely, the physician remains well apprised of the patient's condition before arrival in the physician's office.

In addition, the data management system can remotely monitor a pregnant woman. As a pregnant woman approaches the end of the term, certain vitals signs become particularly important. For example, a physician may monitor the mother's blood pressure, heart rate, and contraction frequency more closely. If the mother had a heart monitor and a blood pressure cuff at home, the data management system could produce a report using these medical readings and transmit it to the mother's obstetrician-gynecologist (OB-GYN). As the OB-GYN analyzes this report, he can more effectively prepare for the mother's delivery. As previously described, the data management system can create an alert based on criteria received from the OB-GYN that indicates which combination of contraction frequency, heart rate, and blood pressure readings warrant the mother's immediate departure for the hospital. Similarly, that data management system can remotely monitor dialysis patients and cancer patients.

Turning now to the figures, in which like numerals refer to like elements through the several figures, FIG. 1 is a functional block diagram of an environment in which the data management system of the present invention can be used. Within the environment **100**, the data management system **105** controls the transfer of information from the patient's current location to a medical facility, such as a nursing home, physician's office, or a hospital **110**. In one application, a pregnant woman **115** records medical data using commercially available medical devices, such as a belt type heart monitor. The data management system **105** receives the readings from a heart monitor and produces a pregnancy report that indicates the status of both the mother and child. For example, the pregnancy report can indicate the mother's heart rate, mother's blood pressure, baby's heart rate, and frequency of contractions. The data management system can transmit this report to the hospital **110** using the satellite **120**. The hospital **110** can transmit a response, illustrated response 1, back to the mother **115** requesting that the mother **115** come to the hospital **110** when the contractions are three minutes apart and her blood pressure is at least 130/85. After receiving this response, the mother **115** can respond accordingly.

Instead of the patient, medical personnel **130** can enter information for the patient **133** using the data management system **105**. Once inside the ambulance **135**, the medical personnel **130** can connect several types of medical devices **140** to the data management system. These devices could include a thermometer **142**, heart monitor **144**, blood pressure cuff **146**, and a data accumulation device, shown as a smartcard **148**. Hence, the data management system **105** can receive temperature readings, heart rate readings, as well as blood pressure readings. The smartcard **148** functions similar to the smartcard described in commonly owned U.S. Patent Application No. 09/799,479 entitled "Computer Information Process and Retrieval System," which is hereby incorporated by reference. Moreover, the smartcard **148** can be used in conjunction with the secure records maintenance system described in commonly owned US Patent Application No. 09/436,323 filed on November 8, 1999 entitled Health Monitoring and Diagnostic Device and Network-Based Health Assessment and Medical Records Maintenance System," which is also herein incorporated by reference.

Hence, the data management system **105** can receive from the smartcard **148** various types of background information regarding the patient. This information could include the patient's name, photograph, age, weight, blood type, physician's name, relative's name, present medical conditions, organ donor status, living will, fingerprint, DNA, insurance, medical history, legal documents, treatment authorizations, medical power of attorney, as well as date of last up date. The patient could receive either a partially programmed smartcard or a fully programmed smartcard. Either type of smartcard could include a first area secured by a global unique identifier (GUID) that includes various types of non-medical information, such as product or rental information. However, this card could also include a second area secured by a second GUID that contains the medical information described above. Medical professionals that possess the second GUID can access the medically relevant information stored on the smartcard **148**. For a more detailed explanation of the use of the GUID, the reader is referred to either of the incorporated patent applications.

When the data management system **105** receives the information from the devices **140**, it processes the information and subsequently generates a collection of reports. For

example, the data management system **105** can generate an admission form by using the name, address, and insurance information received from the smartcard **148**. To generate a triage report, the data management system **105** can receive treatment data entered by medical personnel. For example, medical personnel **130** can speak the treatment administered to the patient **133** using a voice recognition device, as described with reference to FIG. 2. In addition, the data management system **105** receives readings from medical devices. Using the treatment data in combination with the temperature, blood pressure, and heart rate, the data management system **105** can generate a triage report for the patient **133**. The triage report can indicate the patient's vital signs, type of injury, and administered treatment. When the data management system **105** includes a global positioning device, this system can also calculate the estimated time of arrival (ETA) of the ambulance **136**.

By transmitting the triage report, admission form, and ETA to the hospital **110** before the patient **133** arrives, this hospital can more effectively prepare for the patient's arrival. The hospital **110** can route the admission form to its admitting department **152** and the triage report and ETA to its trauma center **154**. Transmitting the admission form to admitting **152** can significantly reduce the amount of paperwork that must be completed by the patient **133** or the patient's family at the time the patient arrives. By receiving the triage report and ETA, the trauma center **154** can insure that it has the proper staff to effectively treat the patient **133**. If the triage report includes a medicinal recommendation, the hospital **110** can request medicine from its pharmacy **156**. Alternatively, the pharmacy **156** can send the requested medicines to the trauma center **154** before the patient arrives.

Once the patient arrives, medical personnel at the hospital **110** can begin effectively treating the patient **133**. At some point, the medical personnel may realize a need for approval from the patient's insurance company for a certain procedure. Consequently, the hospital **110** can contact the Insurance Company's computer system **160** using a communication media, such as the Internet **165**. The computer system **160** could respond by sending a list of approved procedures based on the patient's coverage. In addition, the hospital staff may want to know if the patient's physician made a previous

diagnosis relating to this issue. Similarly, the hospital **110** could contact the physician's computer system **170**. In response, the physician's computer **170** could transmit the latest physician's diagnosis. In one alternative embodiment, the smartcard **148** could store the list of approved procedures and previous diagnosis. In another alternative embodiment, the data management system **105** can download information from either the computer system **160** or the computer system **170**. Armed with this information, the medical staff at the hospital **110** can more affectively treat the patient **133**.

FIG. 2A is a functional block diagram illustrating some of the components of the data management system **105**. The data management system **105** includes several interfaces **205** that control the transfer of data between the data management system **105** and numerous devices. The medical device interface **210** can receive information from various types of medical devices such as a heart monitor **211**, pulse-ox machine **212**, thermometer **213**, glucometer **214**, and blood pressure cuff **140**. These devices can produce medical readings such as heart rate, pulse-oxygen level, temperature, amount of sugar in a person's blood, and blood pressure. Because the data management system **105** can interface with commercially available devices, it can be used in a physician's office, home, ambulance, hospital, nursing home, as well as a host of other locales. An input device interface **220** can receive data from a variety of input devices, which include a keyboard **221**, touch sensitive screen **222**, keypad **223**, voice recognition device **224**, and touch pad **225**. Using one of the input devices **140**, an individual such as a paramedic, physician, nurse, pregnant woman, or diabetic patient, can easily record information. For example, a paramedic could key in treatment administered while en route to the hospital using the touch-sensitive screen **222**. Alternatively, a pregnant woman could verbally record the number of contractions using the voice recognition device **224**. The interface **205** of the data management system **105** can also include a data drive **230** that receives data from various removable storage media such as an optical disk, floppy disk, or smartcard **232**. Using the interfaces **205**, the data management system **105** can either transmit data to or receive data from a host of devices.

As the interfaces **205** transfer data to a control system **240**, this system analyzes the received data and correspondingly prepares a report that details the result of the analysis. For example, the control system **240** could generate a triage report that includes the patient's heart rate and blood pressure readings received from the medical device interface. In addition, this triage report could include the patient's living will as received from smartcard **232** and administered treatment as received from the input device interface **220**. The control system **240** produces a single triage report that identifies relevant medical readings, treatment, and patient wishes. Consequently, a hospital that receives this information can more effectively treat the patient.

The control system **240** can present the received data and any generated reports for viewing using the display **250**. As mentioned above, the display **250** could be an active matrix liquid crystal display. By presenting this information for viewing, individuals using the data management system **105** can easily review readings received from several medical devices in a single location. For example, an emergency medical technician can monitor the patient's heart rate, blood pressure and glucose level by using the display **250**. Moreover, the control system **240** can include software that allows user customization of the manner in which the data is displayed. For example, a paramedic may specify that blood pressure and heart rate should be displayed right below the living will.

The data management system **105** also includes a memory device **260** that can store readings or reports for later use. As the control system **240** produces reports, it can transfer these reports to memory **260**. Subsequently, the control system **240** can compare more recently generated reports with the reports stored in memory. For example, the control system **240** may generate a triage report R_1 at time t_1 and store this report in memory **260**. A minute later, the control system **240** can produce triage report R_2 and retrieve triage report R_1 from memory **260**. By comparing these reports, the control system **240** may append report R_2 to indicate the percentage that the patient's blood pressure dropped in sixty seconds.

Within the data management system **105**, a global positioning system (GPS) device **270** effectively determines the location of this data management system. As the

GPS device **270** transfers this information to the control system **240**, the control system **240** can produce a location report that indicates the distance between the data management system **105** and a desired location, such as a medical facility. For example, the location report could include the estimated time of arrival of an ambulance at a hospital. In addition, this location report could indicate the route that the paramedics will follow in traveling to the hospital, as well as weather and traffic reports. Like the triage report, the control system could also store this location report in memory **260**.

A communication system **280** transfers data between the data management system and remote locations. To transfer data, the communication system **280** includes an interface for a wireless data network **282**. Using this interface, the data management system **105** can either transmit or receive data from remote locations. For example, the communication system **280** can transmit a triage report to the hospital **110**. In addition, this communication system can receive an approval response from the hospital indicating that they are capable of handling the patient. In transmitting the report, the communication system **280** could use the overhead data channel instead of using a frequency in the voice range. Alternatively, the data management system can transmit the report using the Internet **284**. For example, the data management system **105** can include a cradle **290** as illustrated in FIG 2B. Once connected, this system can automatically transfer information to a connected computer system. For example, the data management system **105** can use the cradle **290** in sending a triage report to a remote location. By including the communication system **280**, the data management system **105** can both transmit and receive information from remote locations.

FIG. 3 is a logic flow diagram of a routine for more effectively treating a patient using the data management system of FIG. 2A. Routine **300** begins at step **305**. Step **305** is followed by step **310**, in which the routine **300** receives medically relevant data using the interfaces **205**. As explained with reference to the interfaces **205**, the medically relevant data can include a living will, insurance information, treatment data, as well as other information. Step **310** is followed by step **315**, in which the routine **300** processes the received data. Generally, this processing can include comparing received medical readings with standard medical readings as well as analyzing administered treatment.

Step **315** is followed by step **320**, in which the routine **300** generates reports based on the received data. These reports can include admission forms, triage reports, and location reports. In an alternative embodiment, the routine **300** could include a decision step between step **315** and step **320** that allows specification by a user of whether he wants a report automatically generated.

Step **320** is followed by step **325**, in which the routine **300** identifies a medical facility. In completing this step, the routine may make this decision in light of several variables including proximity, type of trauma, as well as other suitable criteria. Step **325** is followed by step **330**, in which the routine **300** transmits the generated reports to the identified medical facility. This transmission could be done using a wireless network. In step **335**, the routine **300** confirms the hospital's readiness. This routine can complete this step by requesting that the hospital respond to the transmitted report. For example, a hospital may respond to the triage report by indicating that power outages prevent it from treating additional patients.

Step **335** is followed by the step **340**, in which the routine **300** determines if the hospital's readiness has been confirmed. When the hospital confirms its readiness, the "Yes" branch is followed from step **340** to step **345**. In step **345**, the routine **300** updates the report. By updating the report, the routine **300** assures that the medical facility has access to the most recent patient information. If the hospital does not confirm that it is ready, the "No" branch is followed from step **340** to step **350**. In step **350**, the routine **300** determines if it should direct medical personnel to reroute the trauma to another facility. Factors affecting this decision could include whether the hospital responded, the length of time since the request was sent, the proximity of another hospital, as well as other factors. If the routine **300** determines that it should not reroute this trauma, the "No" branch is followed from step **350** to step **345**. Otherwise, the "Yes" branch is followed from step **350** to step **355**. In step **355**, the routine **300** identifies a new medical facility. Step **355** is followed by step **330** in which the routine **300** transmits the report to the newly identified hospital.

In view of the foregoing, it will be appreciated that the present invention provides a data management system for use in administering medical treatment to a patient. It

should be understood that the foregoing relates only to the exemplary embodiments of the present invention, and that numerous changes may be made therein without departing from the spirit and scope of the invention as defined by the following claims.